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Industry Responses to the New DoD Technology and Acquisition Approach

Charles W. Sieber
Office of the Secretary of Defense

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INDUSTRY RESPONSES TO THE NEW DOD TECHNOLOGY AND ACQUISITION APPROACH

Charles W. Sieber

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ABSTRACT

In early 1992 the DoD announced a "New Acquisition Approach" which featured an increased emphasis on technology coupled with reduced plans for weapons production. Industry responses to the new policy have varied considerably but generally reflect uncertainty. The wide range of industry responses are shown to be explicable by means of a framework of three characteristics or factors: These factors are the defense firms' particular areas of business, their size, and by inference, their beliefs about their own abilities to influence future outcomes.

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INDUSTRY RESPONSES TO THE NEW DOD TECHNOLOGY AND ACQUISITION APPROACH

INTRODUCTION.

This paper takes an industry perspective to examine the new acquisition approach announced by the Department of Defense in early 1992. The paper is divided into three sections:

- o A short description of the origins and features of the approach.
- o A survey of selected industry responses, collected from interviews and other sources. These responses include both assertions and observed behavior.
- o Development of a framework to organize the responses.

This paper deals specifically with the acquisition "approach" announced by DoD in 1992. However, most of the industry responses which are described in the paper are probably also relevant to other acquisition strategies which acknowledge a continuing reduction in defense procurement and call for increased emphasis on technology. Then-Representative, now Secretary of Defense, Les Aspin's "resource strategy" which was also released in 1992¹ is another example of such a technology-emphatic strategy.

OUTLINE OF THE NEW ACQUISITION APPROACH.

ORIGINS.

The new DoD acquisition approach fundamentally arises from the need for a plan to help manage the continuing reduction of available defense resources. The reduction in procurement obligation authority has been continuous since the peak of the "Reagan buildup" in Fiscal Year 1985. Meanwhile, overall resource limitations and the changing strategic landscape have made reductions in force structure imperative. The new acquisition approach is part of the effort to match acquisition policies for research and development, and for procurement, to the new realities.

Some of the major themes of the new approach appeared in a 1990 paper prepared by the Institute for Defense Analysis (IDA) which proposed a "flexible" acquisition strategy². In that report the authors recommended a focus on science and technology, and an increased use of "prototyping" techniques in weapons system development. The thoughts in this paper reportedly³ contributed to the development of the new acquisition approach in late 1991.

The new approach made its formal debut at a Pentagon news briefing on January 29, 1992, dealing with the Fiscal Year 1993 defense budget. Secretary of Defense Richard Cheney, Deputy Secretary Donald Atwood, and Chairman of the Joint Chiefs General Colin Powell each addressed the press, with Atwood's remarks

being devoted to the new acquisition approach. Simultaneously, Mr. Cheney also announced the restructuring of several major acquisition programs, and characterized these restructuring actions as being consistent with the new approach.

FEATURES.

The primary guidance available on the new approach's characteristics are contained in subsequent testimony by Deputy Secretary Atwood⁴, and in a collection of four "white papers" which initially circulated rather informally in the Pentagon, and then were promulgated officially under a cover memorandum from Under Secretary of Defense for Acquisition (USD(A)) Donald Yockey⁵. (As of November 1992 there had been no changes made to the existing "5000 Series"⁶ of top-level Defense Department directives which govern acquisition⁷).

The available sources identify four main features of the new acquisition approach:

LESS PROCUREMENT. With force structure declining to the base force level, we have need for fewer weapons. Also, we have a large and modern inventory on hand.

However, even after sharp reductions there will still be substantial defense production. Deputy Secretary Atwood has noted in Congressional testimony that "The news is not all bad for industry. The Department still expects to spend a significant amount on procurement in the years ahead".⁸ Mr.

Yockey later⁹ projected \$300 billion for defense spending on procurement (against \$190 billion for research and development) over the period from Fiscal Year 1993 through Fiscal Year 1997.

EMPHASIS ON SCIENCE AND TECHNOLOGY. To ensure that US defense technology maintains its advantage, the proportion of research and development funding will increase. Technology investment will be focused on seven "thrust" areas, with increased centralization of management.

USE OF ADVANCED TECHNOLOGY DEMONSTRATORS (ATD's). There will be increased emphasis on the use of ATD's. These are research and development programs for which the demonstration of a technology using some form of prototype equipment is the objective. Such programs would not include any plans for production.

Some see this as being in contradiction to the existing policy which sets forth the "full funding" principle. This has previously required the proponent Service to provide full funding--including production if appropriate--through the Future Years Defense Plan (FYDP). This policy has applied to any program seeking approval to proceed to the next phase of development.

However, ATD programs are structured and will be treated differently. Having only demonstrations as their objectives, ATD's will not be acquisition programs as such and therefore will

not need formal acquisition milestone decisions.

ATTENTION TO INDUSTRIAL BASE. Unavoidably, gaps in production of certain defense items will result from the reduction in procurement. The Department will analyze the defense industrial base and take steps to ensure that these gaps do not develop in technology sectors which would be critical to reconstituting larger combat forces in a future crisis.

However, there will inevitably be a significant shakeout in production capacity. Since the Reagan and Bush Administrations have firmly opposed the development of an explicitly stated "industrial policy", the Defense Department has said it will not be attempting to determine the "winners" in this process. In this Administration's view, survival should be a matter of natural selection among the firms. As Deputy Secretary of Defense Atwood himself has put it, those companies that are "...efficient, high-quality producers will probably continue to thrive."¹⁰

Since for defense firms survival may be at stake, they have naturally followed the development of the new acquisition approach with great interest. In the next section we review some of the industry responses.

SELECTED INDUSTRY RESPONSES.

For this section I have sought responses from a variety of sources. Material from personal interviews, from the public statements of corporate executives, and from detailed analyses by industry associations are included. My aim was principally to highlight the widest possible breadth of industry views, and not to tally up the responses nor to attempt to judge their popularity.

The following headings therefore represent no particular attempt at completeness. However, they probably do reflect a bias on my part that this is as much a political topic as a business one. Remember, this was the subject of a press conference, not of changes to the dry directives...

SOME SAY THE POLICY IS NOT CLEAR.

Press reports¹¹ indicate that many firms in the defense business believe the new approach is unclear, although a year has passed since its initial pronouncement. Some with this view acknowledge (but are broadly skeptical of) Deputy Secretary Atwood's declaration that the Department of Defense will ensure that defense research and development business will be made profitable. At the same time, they believe that even under such circumstances, firms in the defense research and development business will operate with reduced profit margins by comparison with their production experience.

The Electronic Industries Association (EIA) has been a leader among trade groups trying to bring attention to collective industry views on the subject. They regularly poll the members of their industry and publish the results annually in the form of business projections. In a special October 1992 report entitled, "Technology Insights for Planning--A Second Look at a New Approach", two of the EIA conclusions are particularly illustrative:

- o On the issue of whether there is industry understanding and acceptance, their comment is, "Not yet."
- o On prospects for the success of the new strategy, they note that there is "Uncertainty ahead."¹²

SOME SAY SMALLER FIRMS WILL GAIN ADVANTAGE.

The president of a small aerospace research and development company is taking a positive view.¹³ He holds that increased emphasis on research and development relative to production will offer several benefits to smaller defense firms. He acknowledges that profits are smaller from research and development programs, both because the profit margins are narrower and the contract sizes are smaller, relative to production contracts for the corresponding end items. However, his view is that the benefits even of these smaller profits to firms with smaller business bases are more significant.

In addition, the large firms have traditionally held a competitive advantage in their ability to spread the cost impact

of a research and development "buy-in" strategy onto their larger production programs. This executive feels that reductions in the total available production funding may reduce this advantage as the larger firms move toward more realistic research and development pricing.

Finally, even if research and development contracts will now be priced to "pay their own way", they are normally far smaller than production contracts for the same end items. This executive suggests that the largest firms may therefore be less interested in competing for the research and development when the likelihood of production is low. (The discussion of a "framework" for organizing industry strategies appears subsequently in this paper. One point made there is that firms may respond to reductions in part by bringing more work in-house and by doing less subcontracting. The resulting reduction in the business available for the smaller firms could plausibly weaken or even reverse the favorable trends this executive anticipates.)

SOME SAY THE ISSUE IS IRRELEVANT TO CERTAIN DEFENSE BUSINESS.

The tactical vehicles segment of defense acquisition continues to be dominated by NDI (Non-Developmental Item)¹⁴ type designs. This results in a low fraction of expenditures allocated to research and development. Even with increased emphasis on research and development, an official in this segment hold the view¹⁵ that no change in the basic character of this market is plausible. In other words, production will continue to

dominate it completely.

Such a conclusion notwithstanding, there are nominal signs of new emphasis. The US Army Tank-Automotive Command has recently solicited ideas for tactical vehicle technology demonstrations. These would include demonstrations for vehicles in the light, medium, and heavy payload classes, but it is not clear whether these can be defined as ATD's.

SOME ARE SEEKING A BALANCE BETWEEN SCIENCE AND TECHNOLOGY, AND PRODUCTION BUSINESS.

A Raytheon Company official asserts that his company's longstanding strategy to keep a balance between science and technology, and production business, readies the company for new acquisition environments.¹⁶ He also has cited his firm's broad implementation of TQM (Total Quality Management) principles as a key element of their preparedness for change. Speaking more generally about reductions in defense procurement, Raytheon Senior Vice-President George W. Sarney is quoted as saying "We're looking for diversity built over 25 years to now pay off".¹⁷ Raytheon currently ranks 5th in defense business volume among all contractors.

SOME ARE SEEKING TO BALANCE DEFENSE AND CIVILIAN BUSINESS.

Keeping a balance between defense and civilian business is a strategy widely advocated among defense contractors, and significantly predates the announcement of the new acquisition

approach. It is therefore more likely to be a general response to the overall reduction in defense spending, than to any proposed alteration to emphasis. The experiences and stated objectives of two firms¹⁸ taken from the current top ten defense contractors are illustrative:

Hughes, a division of General Motors Corporation has reduced the share of its business drawn from defense from 80% in 1988 to 65% now, and has 50% as a goal. Lockheed Corporation now does 70% defense business, and seeks to reduce this to 60%. In Lockheed's case, this seems to be at least a rhetorical reversal in the interval of time since the new acquisition approach was announced: In 1991 Lockheed chairman Daniel M. Tellup was quoted as saying scornfully that, "Some companies are getting out of the defense business, but you're not going to find Lockheed in the year 2000 building patio furniture and canoes."¹⁹

SOME ARE LIQUIDATING BUSINESS UNITS.

General Dynamics Corporation, the second largest defense contractor, has recently been aggressively pursuing a strategy of selling off its own business segments. This began with sales of "non-core" business units, but by November 1992 reportedly included disposal of major segments of their defense business. At that time Senior Vice President and Chief Financial Officer James J. Cunnane was quoted as saying about the Fort Worth division, which produces F-16 fighter aircraft, "We are open to selling the core businesses. It's an alternative we will consider."²⁰

(General Dynamics subsequently did sell the Fort Worth division, to Lockheed--apparently confounding the "balance" point made about Lockheed under the preceding heading!)

Of course the subject of selling off business units can't be left without acknowledging the presence of the reversed strategy. By definition for every sale there is a buyer; presumably for every firm with a strategy of liquidating there must be one with a plan for acquiring. We return to this point in the following analytical section when discussing the underlying shapers of strategy.

ANALYSIS OF INDUSTRY RESPONSES--A FRAMEWORK

What underlying factors work to shape strategies? What framework can we use to organize the wide range of industry responses and to understand their sources and rationale?

To provide such an organizing framework, I propose to identify three characteristics or factors which plausibly influence industry decisionmakers and help shape their formulation of strategy. It will be instructive to then take from the previous section the variety of assertions and behaviors gathered from industry and to explore how each may be logically associated with one of the three "shaping factors".

The three "shaping factors" I propose are:

1. The firm's **BUSINESS SECTOR**, i.e., its location in a particular industry.
2. The firm's **SCALE**, the size of its business base.
3. The internal **BELIEFS** of the firm's strategists.

Before discussing each of these we should acknowledge that some responses which suit the new approach are not primarily shaped by these factors but are just good business. In particular, they are good business in circumstances of intense competition like the shrinking defense market. In the defense industry, the steady decline since 1985 has probably resulted in a continuing process of natural selection among defense firms. If a firm is still around today to be formulating strategy, it is likely to have been working along these lines already:

For example, the advice to stick to basics, or as Peters has argued, to the firm's "core competencies" certainly applies. This is no time for forays into new defense segments where the current occupants are already in an intense shakeout process. Neither are the prospects for success good in non-defense segments which are new to the firm. Overall economic growth is surely not supporting the successful entry of segment newcomers-- and in particular the success rate of defense "conversion" efforts is essentially zero.

Developing lean and agile organizations also suits the situation, particularly when fighting for a share of the shrinking production business. As Deputy Secretary Atwood observed in remarks quoted earlier, the extremely tough competition for this work will favor those firms which are ready to operate most efficiently.

Some other patterns of behavior are also natural in any time of business contraction. In an example mentioned earlier, we should expect firms to bring more work in-house to help retain their work force and to streamline operations.

These very general behaviors are broadly applicable to a variety of business segments, whether in or out of defense. We will now discuss some other strategies in terms of how they are shaped by specific factors. Table 1 displays some of these associations.

SHAPING FACTORS	Firm's business sector	Firm's scale	Strategist's internal beliefs
VIEWS AND STRATEGIES	<ul style="list-style-type: none"> o Ignore as irrelevant o Leverage from commercial production o Leverage from export markets 	<u>Small firms</u> <ul style="list-style-type: none"> o R&D specialization o Better competitive position for R&D <u>Large firms</u> <ul style="list-style-type: none"> o R&D less attractive o Lobbying ability o Needed for major manufacturing 	<u>Surreal</u> <ul style="list-style-type: none"> o "unclear" (as to substance) o Cosmetic response <u>Linear</u> <ul style="list-style-type: none"> o Balance R&D with production o Balance defense with commercial o Long term planning o Quality emphasis o Acquire other business units <u>Nonlinear</u> <ul style="list-style-type: none"> o defer decisions o short term gains o liquidation o "unclear" (as to outcome)

Table 1. Shaping factors with associated views and strategies.

RESPONSES ARE SHAPED BY THE FIRM'S BUSINESS SECTOR.

One somewhat extreme example is illustrated by the "not relevant" response from a relatively low technology defense segment (i.e., tactical trucks) noted earlier. This firm believes that no special strategy for responding to the new acquisition approach is necessary, since they believe research and development will continue to be an insignificant portion of the total business. However, most firms probably expect to operate with a more balanced proportion of research and development business.

In some other sectors, it may be appropriate for firms to

seek financial leverage for such a balance from closely related commercial production lines. In this case the comparative technology level between the defense and commercial products will be a key consideration. Taken to the limit, this approach might lead to production of military and civilian end items on the same production facilities.

Existing regulations probably make this ideal even more of an administrative than a technical challenge. A wide range of issues including government contract audit regulations and rules for recoupment of government research and development investment would have to be addressed. Under the Reagan and Bush Administrations, policies required the development of such strategic linkages to commercial business to be strictly at the firm's initiative. The government would expect to maintain a strictly arm's-length relationship. If the new Administration takes a different approach to "industrial policy" it could potentially change regulations to make this approach more feasible.

Other firms may find it most relevant to seek increased share in overseas markets for the balance. Here again, the technology content of the business is a key factor, since export licensing issues will arise. Among many complications for export business, one is particularly relevant to a strategy of seeking initial production sales overseas: Current Defense Department policies for arms export include the general proscription by the Under Secretary of Defense for Acquisition of export sales of

weapons systems which are not already being acquired for US forces.

RESPONSES ARE SHAPED BY THE FIRM'S SCALE.

As discussed earlier, some aspects of scale may yield advantages for smaller firms under the new acquisition approach. With less corporate overhead to support, they may more readily survive on either the smaller profit margins or the reduced overall size of research and development contracts. This is especially plausible under new acquisition approaches which call for science and technology focus and which encourage technology demonstration efforts. These approaches will presumably result in emphasis on the earliest stages of research and development, where the so-called "wedges" of required program funding are the thinnest.

One observer with senior executive experience in government and industry suggests that this factor could encourage the increased emergence of specialized firms dedicated to defense R&D.²¹ These firms would be organized primarily as research and development laboratories with little expectation of following up R&D with production programs. Instead, they would expect to hand off what few production opportunities came along to the larger firms.

However, it is an open question whether an increasing tendency to such "handoffs" would be a technically favorable trend. The transition between the development and the production

phases of a new weapon system acquisition has always been one of the greatest challenges facing a defense program manager--even when the same firm is responsible for both phases.

In fact, any such trend toward switching firms for the production phase, (and perhaps by extension, between the successive phases of research and development) would raise some fundamental issues about how defense technology actually progresses. If a trend toward such switching developed, we might find that the larger firms, and in particular their corporate experiences gained across the entire spectrum of development and production, had been a key ingredient of technology progress. Notwithstanding the innovative capabilities of small firms, the sustained development of technology may depend on the presence in the sector of healthy larger firms, having critical masses of size and experience. This suggests that the continuing progress of technology could be hurt if the available work is partitioned among smaller firms. (General Dynamics CEO William Anders has also invoked this "critical mass" image to justify his selloff strategy--his position is that a firm will need this size just to survive, and if it won't be GD it might as well be somebody else...)

Certainly, only the larger firm has the resources to set up major manufacturing facilities. Also, far more political interest is aroused in the survival of the large firms. They are the only ones able to gain individual visibility by lobbying at government policy and legislative levels.

RESPONSES ARE SHAPED BY THE FRAME OF THE STRATEGIST'S BELIEFS.

The preceding factors were based on a firm's physical attributes--characteristics which would be judged similarly by any observer. **Business segment** and **scale** are objective and spatial in nature--and while not unchanging they involve a consistent perspective. In contrast, I propose that a strategist's **beliefs** are not visible to observers and must be judged by inference.

Moreover, I suggest that such beliefs by the strategist about his environment, and in particular about what influence he may exert on future outcomes, apparently vary widely enough to shape a broad range of industry responses. While the other factors of **business sector** and **business scale** can be seen as having spatial dimensions, considerations of dynamics of systems inherently have a temporal dimension--in this case for beliefs about future outcomes. We can examine three alternative points on this temporal scale:

SURREAL--"It's not real; future outcomes are irrelevant". For the case of the new acquisition approach, this point of view might be argued by observing that no changes have yet been necessary in the existing 800 pages of governing directives. From this perspective one plausible explanation for the new acquisition approach could be that it was never intended to be substantive. A person holding such a view could easily suspect

that the new approach mainly provides some political cover for a conservative Administration to make distasteful reductions in defense spending.

The surreal view also tends to see the new acquisition approach as a transitory "initiative of the month". In this case it may have lasted only until January 1993, since many have expected²² this policy area to be subject to substantial revision under a new Administration. The issue of "industrial policy" is certain to see new developments, and the hands-off premises which so far underlie implementation of the new acquisition approach could be substantially altered.

Most importantly for this paper, from the standpoint of strategy formulation, one who holds this view will conclude that no real response to the new acquisition approach is necessary. (Of course, a cosmetic or token response by the firm may be appropriate for public consumption.) I suspect that the widely-heard assertion that the new acquisition approach is "unclear" is often a euphemism for "not real". The Electronics Industries Association report cited earlier phrases this view diplomatically and compactly by saying about the new policy: "industry understanding and acceptance--not yet"²³ [emphasis mine].

LINEAR DYNAMICAL SYSTEM--"It's an incremental policy change; it has predictable future outcomes". Holding this view encourages the strategist to focus instead on long-range planning and on the formulation of orderly incremental changes to business

plans. His underlying assumption is that the overall response of the system to these inputs can be predicted with useful accuracy.

A strategist with this view believes that after an input or perturbation the system will return to a new state of equilibrium, and that the resulting change will be on a scale consistent with the scale of the input. He typically relies heavily on his analysis of the recent past, and is confident of his understanding of results when he makes business decisions based on predictions of the future.

A very explicit articulation of this view of confidence in outcome for a very complex system is contained in one of the USD(A) "white papers" which were cited earlier. Referring to the expected response of the entire defense industrial base to dramatic reductions in spending (and in particular to the new acquisition approach), the paper asserts that, "Generally speaking the industrial base will not reach a new equilibrium overnight, nor will the transformation be drastic."²⁴

Strategies such as long-term adjustments in business mix, and willingness to invest in future gains by incurring near-term cost or compromise, are likely to result from this view. It is also consistent with an interest in continuing quality improvement.

I speculate that among strategists with this view are some of those who are currently ready to buy segments of other firms' defense business. Their assessment would be that they are investing near-term resources in the expectation of future

benefit.

NONLINEAR DYNAMICAL SYSTEM--"It is futile to try predicting long-term future outcomes". Here it is appropriate to digress for a very short discussion of chaos, a scientific conceptual framework for the behavior of dynamical systems. In the last two decades this concept has gained wide attention as a tool for explaining the behavior of a very wide range of complex systems.

Traditional applications have been to intractable physics problems of the natural world, like turbulent fluid flow and weather forecasting. These are problems where the behavior is influenced by mathematically nonlinear terms. However, chaos has recently attracted interest for application to complex problems of human behavior, especially where outcomes are the result of actions taken by a large number of people. If these individual actions interact with each other, nonlinearity is introduced. Application of chaos theory with the behavior of the stock market²⁵ and to military strategy²⁶ are recent examples of such interest.

Several theses of chaos theory make it potentially relevant to this application, namely to how decisionmakers may view their environment. In particular, the theory holds that:

- o Complex dynamical systems invariably contain some elements of nonlinear behavior.
- o Inputs or perturbations to a nonlinear system may have unpredictable effects. In our application, a business

transaction or plan may result in an unexpected outcome--decisionmakers may commonly have already experienced this sort of result. (Compare this with the assurance of the management view expressed in the "Defense Industrial Base" white paper quoted above.)

- o Even for a small input the effects may be very large. Alternatively stated, a small (perhaps unnoticeable) difference in initial conditions can lead to completely different outcomes.

A strategist with this internal view will naturally do what he can for immediate profit, and seek actions which hedge against the uncertainty of the future. In recognition of this uncertainty, he will be inclined to defer decisions whenever possible. He is also unlikely to actually pursue long-term goals which will incur near-term costs or compromise. And like the strategist who takes the "surreal" view, he may claim the new acquisition approach is unclear. In fact to him the business and technical aspects of the approach may be perfectly clear (after all, I hear no one suggesting that the approach itself contains any subtle mysteries). I suggest that instead his concern for lack of clarity is not for the approach but for the outcome.

On the subject of outcomes, there is a disquieting trend in some recent events that suggests that large firms may actually have surprisingly little ability to control their own direction. In spite of their powerful resources their ability to sustain chosen strategies may be limited. The shifts in public rhetoric

by Lockheed Corporation in just one year, from 1991 public bravado on defense business mix, to 1992 retreat on business mix as discussed earlier, and then to acquisition of a large piece of General Dynamics' defense business, comes to mind.

The current General Dynamics selloff of business units also represents a reversal in strategy. Just two years ago, General Dynamics was reportedly planning to reduce its 90% dependency on defense business by increasing diversification into non-military business. By October 1991, they were reversing course--with chairman Anders being quoted as saying, "Frankly, swordmakers don't make good and affordable plowshares...we should focus on what we know best; our core defense competencies."²⁷ Now, the passage of just more one year has apparently driven his corporation to do-it-yourself surgery on core defense business. (This paper does not address the range of additional issues raised for DoD by such sales, e.g. the suitability of buyers, especially those overseas, or their interest in continuing the defense business relationship.)

A strategist with these experiences will see no lesson in the past for the present starting conditions. In the extreme, he may be completely frustrated by his inability to plan a profitable course of action. It seems plausible that selling off one's core business is symptomatic of such an attitude.

Ironically, such an attitude could also lead to buying up business units. This is an alternative to the earlier hypothesis that buyers are making long-term business decisions as a result

of their linear view. Instead, sellers and buyers alike can be seen as frustrated by their inability to predict or to control their futures. From this perspective, both the selling and the buying of major defense business units are to some degree attempts to exert some arbitrary control over uncontrollable events--and to that degree do not genuinely reflect rational business strategy.

I suggest they bear instead some resemblance to victims of eating disorders--corporate variants of anorexia and of compulsion, encouraged by the stress of their nonlinear view of the environment.

CONCLUSIONS

- o Industry is expressing a wide range of reactions to the new acquisition approach. Although reactions to the approach tend to describe it in simple terms, a prevalent theme is uncertainty, evidently for future outcomes.
- o It is instructive to organize the wide range of industry assertions and behaviors under a framework of three shaping factors. This analysis indicates that some industry reactions are related to the firms' **SEGMENT** and **SCALE**. However, it can be inferred that many may also be shaped by strategists' internal **BELIEFS**. The wide range of assertions and behaviors suggests disagreement and uncertainty in the

ability to understand or influence future outcomes.

o I believe this stands as a warning for the proponents of either the "natural shakeout" or the "industrial policy" government approaches. On the one hand, the process of natural selection evidently will be impaired by imperfect knowledge on the part of the participants. On the other, attempts at intervention may have potential for large unintended consequences.

o Finally, study of the origins of the new approach, and reflection on its first year and on industry responses, suggests that this is about politics, and perhaps about psychology, as much or more than about business.

1. Cochrane, Charles B. "DoD's New Acquisition Approach--Myth or Reality?", from Program Manager, July-August 1992, pp. 38-46. This article describes a number of current initiatives including the DoD approach and Representative Aspin's 1992 proposal.
2. Richanbach, Paul H., et al, "The Future of Military R&D: Towards a Flexible Acquisition Strategy, IDA Paper P-2444, July 1990.
3. From interview with Dr. John Christie, October 92. At that time Dr. Christie was the Director for Acquisition Policy and Program Integration, Office of the Under Secretary of Defense (Acquisition).
4. One example is Deputy Secretary of Defense Donald J. Atwood prepared testimony for House Armed Services Committee Subcommittees on Research and Development and Procurement, April 28, 1992.
5. USD(A) memorandum of May 20, 1992.
6. Department of Defense Directive DoDD 5000.1; Department of Defense Instructions DoDI 5000.2 and DoDI 5000.2M.
7. At that time (November 1992) I was advised by acquisition policy officials that they had assembled a package of relatively minor changes to the directives. They intended to soon circulate it for coordination. At the time of this writing (February 1993) the status of even these small changes is unclear--among other developments neither an Under Secretary for Acquisition nor a Director for Acquisition Policy have been named by the new administration.
8. Deputy Secretary of Defense Donald J. Atwood prepared testimony for House Armed Services Committee Subcommittees on Research and Development and Procurement, April 28, 1992.
9. White Paper, "Defense Industrial Base", p.3, attachment to USD(A) memorandum dated May 20, 1992.
10. Interview in "Government Executive", August 1992, p.65.
11. Cited in August 1992 "Government Executive".
12. "Technology Insights for Planning--A Second Look at a New Approach", Report of the Electronic Industries Association 28th Annual Ten-Year Forecast Conference of Defense Electronic Opportunities, October 20-22, 1992.
13. From interview with Mr. Frank Piasecki, November 10, 1992. Mr. Piasecki was a pioneer in the helicopter industry and is currently president of Piasecki Aircraft Company.

14. A "Non-Developmental Item" may be a direct commercial equivalent, but in the case of major defense equipment items the phrase has been more often used to describe a system which has been modified from a commercial item, or assembled principally from commercial subsystems.
15. From interview with representative of a major tactical vehicles prime contractor, November 6, 1992.
16. Raytheon briefing to April 92 ADPA conference.
17. Cited in "Business Week" 11/16/92, "Raytheon's Strategy: Guns and Lots More Butter" p.96.
18. Cited in "Government Executive", August 1992, p.24.
19. From interview with "USA Today", cited in "Government Executive" August 1992, p.12.
20. Quoted in "Wall Street Journal", November 3, 1992, p.1.
21. Interview with Mr. R. James Woolsey, November 6, 1992.
22. Ibid.
23. "Technology Insights for Planning--A Second Look at a New Approach", Report of the Electronic Industries Association 28th Annual Ten-Year Forecast Conference of Defense Electronic Opportunities, October 20-22, 1992.
24. White Paper, "Defense Industrial Base", p.3, attachment to USD(A) memorandum dated May 20, 1992.
25. "Chaos Hits Wall Street--The Theory, that Is" Business Week, November 2, 1992, p.138.
26. Mann, Steven R., "Chaos Theory and Strategic Thought"; Parameters--US Army War College Quarterly Vol XXII No. 3, Autumn 1992.
27. Cited in "Government Executive", August 1992, p.67.